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Edited by F. R. Moulton and Sam Woodley.

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Animal and Human Inheritance

According to the first chapter of Genesis, on the fifth and sixth days of Creation God created creatures of the sea, creeping things, fowls of the air, and beasts of the earth, and ordained that they should bring forth young after their respective kinds. Then God created man and gave him dominion over the lower animals, but did not state explicitly that he should bring forth young after his own kind. Yet one of the most obvious facts of human and higher animal inheritance is that they are essentially similar. Consequently the general characteristics of human inheritance may be investigated not only from records of descent of human beings but also from the enormously more abundant records available for lower animals. Moreover, in animal inheritance experiments can easily be made.

Perhaps the most striking and important characteristic of inheritance is its stability, or fidelity to type. Although the young of any species may differ appreciably from their immediate parents because they carry the genes of numerous ancestors, yet in the species and even the variety sense they are remarkably stable. Human beings, for example, are so stable genetically that long periods of living under widely different climatic conditions, eating widely different foods and having widely different habits have not produced very substantial physical differences in them.

It is the similar, but perhaps less perfect, stabilities of emotional and mental inheritance that enable society to survive the shocks of disaster. However great the suffering and deep the despair, after crises pass the human spirit rebounds, sometimes to a golden age, as is illustrated by the periods that followed the bondages of the Jews, the Persian invasions of Greece, the Crusades, and the plagues of the Middle Ages. On the basis of the records of history we may be confident that after the close of the present war more splendid cities will be built on the ruins of those that have been destroyed; and we may be highly hopeful that after the fires of passion have burned low humanity will approach a realization of "the Parliament of man, the Federation of the world."

As much as animal and human inheritance have in common, there is, however, one respect in which they are vastly different. In the strict biological, and perhaps most fundamental, sense inheritance implies that the determining units, the genes, of one individual live and flourish in the cells of another; that, in a real sense, the one continues to live, in part, in the other. But in the domain of the intellect inheritance is not limited to such cumbrous methods of transmission. After the evolution of the power of speech minds spoke to other minds directly and effectively, independently of genetic relationship, with resulting acceleration of the evolution of the cerebral cortex. With the later invention of writing those who dwelt afar could send their words across the intervening spaces, and those who were dead could still speak to the living.

In a real sense we are direct intellectual descendants of all whose words have influenced our minds. The writing of Moses and David and Solomon are precious parts of our heritage, as in other fields are those of Greek scientists and philosophers. From the Jews we have inherited theology; from the Egyptians, geometry; from the Persians, astronomy; from the Babylonians, mythology; from myriads of others, the wisdom that has been distilled out of the dross of the lives of a thousand generations. Shakespeare to the contrary notwithstanding, the good that men do lives after them and the evil is generally interred with their bones, for the enduring heroes of the race are not its imbeciles or criminals or greedy or rich or powerful or even conquerors. Instead, those who live most abundantly in the lives of their successors are the wise, the good,

the generous, the morally great. For this reason alone the prospects for the future of humanity are favorable.

A few generations ago a new factor, science, began to become important in human life and to influence the evolution of man. There have been grave fears that science may prove disadvantageous to society and suggestions have been made that its cultivation cease for a time. Those who have had these misgivings apparently have thought of it as producing such things as bright lights, fast cars and high buildings, and providing leisure, luxuries and license. But science is much more than gadgetry and it has a higher mission than catering to the senses. It even does much more than place within easy reach of everyone the spoken words of the living and the written wisdom of the dead. It is discovering and reconstructing civilizations long lost and forgotten, and it is deciphering the paleontological records of the successes and failures of myriads of forms of life from the beginning of geological time. Through science all the life that is and has been on the earth is now telling us the enchanting story of its origin and early history, of its evolution and triumphs, and of its failures and disappearance. To the extent that we listen to and learn from those voices, that speak more truly and miraculously than the radio, do we at least become the heirs and in a sense the descendants of all the life that has flourished on the earth.—F. R. M.

Postwar Education—II. Science

Science has helped to make the most terrible of all wars. That could also be said of the kind of education that has helped to produce modern science. The same could be said of society which fosters education. It could also be said of the research spirit which results in discovery. Even curiosity to know the unknown might be called into account. Anything that is new may cause changes in men's ways of destruction as well as construction. Whatever is included in advancing civilization must share the responsibility for the tragedies of war, because our present situation has developed from its immediate as well as from its remote past.

Another kind of picture might be drawn. The war cataclysm produces powerful and insistent pressure upon educated men for new ideas, invention, materials, processes, machines; for hasty near-by and long-distance transportation of men, goods, and messages; for transportation and communication upon the earth's surface, beneath its waters, and at almost unbelievable heights; for old and new medicines and treatments to save those hurt by the cataclysm; for discovery in many fields of fundamental science of which discoveries, great new services are welcomed exponents. Without doubt the war period has already made fundamental disclosures upon which new and far-reaching industries will be based. Strange-looking factories, making strange new things, will use workmen to do tasks which imagination is just beginning to outline. War stimulates discovery and accelerates its applications. War problems are insistent. Directness and intelligence of attack are imperative. Testing of results is done quickly and in terms of human values. Indeed, validity of ideas and of their application reaches a high level. Personal interest in a given discovery must disappear within the larger interests of many people. War produces so much new scientific knowledge, partly secret and intricate, that general knowledge of it cannot catch up for a long time after war's end. But sooner or later new knowledge becomes the possession of those educated to understand. At no previous time in human history have there been so many highly educated, able men and women so earnestly, unselfishly, and successfully seeking new scientific knowledge.

"Science Remaking the World," when used by Dr. E. E. Slosson and myself as title for a book, was widely acclaimed, and was used by others as a fitting title. It seemed that science was the major factor in making a new world. That title is not now appropriate, indeed is almost misleading. Much larger than science is the whole of human achievement of which science is a highly important part. The significance of the proper uses of science greatly exceeds the importance of the body of established and organized knowledge which is called science. Mere increase in scientific knowledge is helpful or harmful in terms of the ultimate influences upon people. The worthy goal of discovery is human betterment. How can this be harmonized with science for destruction of men and things?

In a very true sense, knowledge is objective and impersonal. It is men's motives which make subjective and personal uses of knowledge. There is nothing new about that statement. Wars throughout the ages have done the kinds of things that are now being done. Doubtless bows and arrows were valuable inventions for securing food. But the tribes possessing them could turn them to advantage in wars against other tribes who needed to come close enough to throw stones or wield their clubs. The "other

tribes'' learned quickly, though some of their members died, and soon all warriors had bows and arrows. Such is the history of discovery and invention. The former scale of action was smaller and instruments of destruction were different because less knowledge was available, and fewer, less-educated men were involved. We are now able to have a huge, a global-tragical war, the first in human history. Scientific knowledge has improved far more rapidly than have the motives which guide its uses. Improvement of motives is far more difficult and intricate than are the discoveries through which scientific knowledge advances. The spirit of scientific rightness, and truth in human relations evolves slowly in a nonscientific society, not rapidly even among scientists. It is imperative that there be a new age of science and society in which those who cause science to grow accept their full part of the responsibility for the proper uses of knowledge. No retardation in discovery, invention and scientific industry is likely to occur. There must be an unprecedented increase of understanding and loyalty to the services to be rendered to a confused and inadequately guided society, badly in need of clarity regarding enduring principles and methods of human betterment. Here is an area of research, a chaotic area as yet, whose demands will fully utilize the capacities, techniques, and patient faithfulness of workers of strictly major rank. Such workers will need even wider and more intensive personal education than is common even in good scientific research. The significance of returns from such research is likely to exceed those of so-called pure science.—OTIS W. CALDWELL, General Secretary, A. A. A. S.

AAAS-Gibson Island Research Conferences

On June 12 the seventh series of AAAS-Gibson Island special research conferences on chemistry will begin. There will be eleven conferences during the summer of 1944, each extending over a period of five days, from Monday to Friday, inclusive, on successive weeks, the final conference beginning on Monday, August 21. The subjects of the eleven conferences are:

1. Petroleum Chemistry. June 12–16. FREDERICK D. ROSSINI, chairman; GEORGE CALINGAERT, vice chairman.
2. Catalysis. June 19–23. OTTO BEECK, chairman; P. H. EMMETT, vice chairman.
3. Organic Highpolymers. June 26–30. H. MARK, chairman; EMIL OTT, vice chairman.
4. Medicinal Chemistry. July 3–7. D. L. TABERN, chairman; W. G. BYWATER, vice chairman.
5. Textiles. July 10–14. MILTON HARRIS, chairman; WARREN F. BUSSE, vice chairman.
6. Strategic Materials. July 17–21. ROBERT CALVERT, chairman; RICHARD J. BLOCK, vice chairman.
7. Vitamins. July 24–28. WALTER C. RUSSELL, chairman; JAMES WADDELL, vice chairman.
8. Cancer. July 31–August 4. DEAN BURK, chairman; RALPH G. MEADER, vice chairman.
9. Corrosion. August 7–11. F. L. LAQUE, chairman; G. H. YOUNG, vice chairman.
10. Instrumentation. August 14–18. W. G. BROMBACKER, chairman; J. G. ZIEGLER, vice chairman.
11. X-ray and Electron Diffraction. August 21–25. LESTER H. GERMER, chairman; P. DEBYE, vice chairman.

The complete programs of the first and third conferences are given below; programs of the other conferences will appear in succeeding issues of this BULLETIN.

1. Petroleum Chemistry (June 12–16)

Lubrication, Vladimir A. Kalichevsky; Wartime Thermal Cracking, William E. Chalfante.

Chemicals from Petroleum, Theodore W. Evans; Hydrocarbon Polymers and Synthetic Rubber, Per K. Frolich.

Extractive and Azeotropic Distillation, Manson Benedict; Fractionation and Analysis of Hydrocarbons Adsorption, Beveridge J. Mair.

Interpretation of Hydrocarbon Reactions with Carbonium Ion, Paul D. Bartlett; Physical and Thermodynamic Properties of Hydrocarbons, Frederick D. Rossini.

Spectrographic Analysis of Hydrocarbons, Otto Beeck and R. Robert Brattain.

3. Organic Highpolymers (June 26–30)

The Electron Microscope as a Research Tool for Highpolymers, speaker to be announced; X-rays and Highpolymers, I. Fankuchen.

Infrared Spectroscopy and Highpolymers, R. B. Barnes; The Ultracentrifuge as a Research Tool in the Field of Organic Highpolymers, C. Beckman.

Copolymerization, F. T. Wall; Fatigue and Aging of Highpolymers, W. E. Roseveare; Fundamental Aspects of Mechanical Testing, H. F. Wakefield.

Viscosity, Osmotic Pressure, Molecular Weight and Internal Structure of Highpolymers, H. M. Spurlin (tentative); Fractionation of Highpolymers, S. Coppick; Chemical Determination of Chain Length, M. Harris.

Structure and Properties of Synthetic Elastomers, speaker to be announced.

Gibson Island, an island of about 1,000 acres controlled by a corporation, lies in Chesapeake Bay about 20 miles south of Baltimore from which it may be reached by bus. The conference property, consisting of a large residence and auxiliary buildings on a wooded lot of 3.6 acres on the highest hill on the island, provides a conference room, reading room and accommodations for about 60 persons. Others attending the conferences make arrangements, through the Director of the conferences, to live at the Gibson Island Club or in one of its cottages. All meals are taken at the Club.

The Island offers opportunities for golf, tennis, bathing in both salt and fresh water, fishing and

swimming. Yacht races are held off the shore at various times during the summer.

The conference property was purchased and furnished by the Association with gifts of $1,000 each from industrial companies whose laboratories have been represented at the conferences, each company having the right to have one representative at each of the conferences. The attendance at each conference is limited to 60 persons, to be distributed as widely as possible among representatives of industrial, foundation and university laboratories.

Registration for the conferences for the coming summer should be made before February 20 with the Director, Dr. Neil E. Gordon, Wayne University, Detroit, who is Secretary of the Section on Chemistry of the Association.

New Officers of the Association

In normal times officers of the Association are elected by the Council at the annual meetings which are held during the week following Christmas. Now that general meetings of the Association cannot be held, the Executive Committee directed the Permanent Secretary to conduct an election of officers by mail ballot.

The officers of the Association to be elected were a president for 1944, a vice president from each section for 1944, two members of the Council for a four-year term ending at the close of the December–January meeting in 1947–48, and two members of the Executive Committee for the same four-year term. Because of difficulties in balloting by section committees, the nominations of vice presidents from the sections will be submitted later to the Council for final action.

Nominations for president of the Association were made by mail ballot sent out last August. Sixteen fellows of the Association were nominated for the presidency, distributed among the scientific fields represented by the sections as follows: chemistry, 3; astronomy, 1; geology, 2; zoological sciences, 2; botanical sciences, 1; anthropology, 1; psychology, 1; social and economic sciences, 1; engineering, 1; and medical sciences, 3. On October 1, a ballot containing the names of the 16 nominees of the Council was sent to each member of the Association with the request that he express his choice for president from among the nominees or by voting for any other fellow of the Association. More than 6,100 ballots were cast which were distributed so widely among the nominees of the Council and others that no person received as much as 15 percent of the votes cast.

In November ballots for all officers were sent to the members of the Council on which were recorded the results of the general membership vote for president The Executive Committee placed in nomination for the two members of the Council to be elected four fellows of the Association, one each from the fields of entomology, plant physiology, physics and botany, which were included on the same ballot. Finally, the Executive Committee nominated for election to it the two members whose terms were expiring and also two other Association fellows. The votes cast by the Council resulted in the election of two members of the Council and two members of the Executive Committee, but no person received a majority of the votes cast for president of the Association on either the first or second ballot. Hence a third ballot had to be taken which was closed on December 31, 1943. The results of the ballots of the Council certified by the three tellers appointed by the Chairman of the Executive Committee to count the votes were as follows:

President

Anton Julius Carlson (physiology), The University of Chicago

Members of the Council (1944–1947)

George B. Pegram (physics), Columbia University

William J. Robbins (botany), New York Botanical Garden

Members of the Executive Committee (1944–1947)

Arthur H. Compton (physics), The University of Chicago

Elvin C. Stakman (plant pathology, mycology), University of Minnesota

The February Scientific Monthly

In the February issue of *The Scientific Monthly* there will be nine principal articles, as well as the sections called Science on the March, Book Reviews, Comments and Criticisms (both cruelly caustic and casually complimentary), and Meet the Authors (thumbnail portraits and sketches of the nine contributors).

This number of the *Monthly* starts off with a discussion of social scientists (not physicists and chemists) by a somewhat unorthodox social scientist who last year was president of the American Sociological Society. The next article consists of reflections on the pursuit of science by a geneticist and professor of biology, born and educated in Germany, whose wisdom and clarity of thought are matched by the distinction of his style.

In the third article a New York attorney at law reminds us that in the days when our gov-

ernment was being established there lived in this country one of the most original, versatile, and profound thinkers in the world—Thomas Paine. This author is followed by a scholar and editor, now on leave as a Captain in the Adjutant General's Office, who discusses stoves (not feet) of clay. Another scientist giving all his time to war work, in this case to blood plasma in the Harvard Medical School, diverts our attention from casualties at the war fronts by showing that continually there is death in life.

A director of a museum in our Big Southwest, in an illustrated article, describes a complicated labyrinth design appearing in the art work of the desert Indians that is essentially the same as that found on Cretan coins, on an Etruscan vase, and in various places throughout Europe; and he speculates on the time and manner of its entry into this continent. At a far distant extreme of sophistication, one of the foremost mathematicians of our time discusses in relatively simple language the absolutely profound question of the nature of various theories of gravitation. These widely different articles are followed by a description of the great roster of classified scientists, organized for the Government by the president of an eastern college to aid our armed forces in securing promptly men qualified by specialized training for any kind of technical work that may arise.

There remains the final contribution, an article on the duration of the sun and the stars, written by a man from the land of telescopes and theories —California. It is recommended that before reading this article the uneasy citizen turn off the radio, put on his slippers, sit before a grate fire, and light a mild cigar. It is confidently predicted that while he is reading and thinking of the sun and the stars the cares of the day will "fold their tents, like the Arabs, and as silently steal away."

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Members of the Association receiving *Science* with their memberships may also receive *The Scientific Monthly* by paying $3 additional per year. The subscription rate for nonmembers is $5 per year.

Further Experiments in Regional Meetings

In the November issue of this BULLETIN, page 83, the plans of the American Society for Horticultural Science for holding regional meetings during the war period were reported. Now Dr. H. B. Tukey, Secretary of the Society, reports on a meeting in St. Louis about the middle of December held jointly with the American Pomological Society, following a somewhat similar meeting in Chicago the last of November.

These meetings of the horticulturists differed in two respects from the great meetings they hold at the annual meetings of the Association. The fact that they are local makes it possible for many members to attend who could not conveniently travel the long distances to the large general meetings. The second advantage is that they hold sessions and hold informal conferences with other groups with whom it is important for them to have close contacts. For example, horticulturists have interests in common with scientists and manufacturers who develop and produce fertilizers, insecticides, and various kinds of equipment. At the local meetings so far held, the horticulturists have held at least one session for their own members at which there were adequate opportunities for discussing the papers presented.

Public Library Reading in 1943

According to a survey by the American Library Association of a cross section of the country reaching from large cities to suburban and rural areas, there was a general decline during 1943 in the use of public libraries except by young people and children. But on the whole public libraries were used by adults in 1943 for more serious purposes than in earlier years. There was a substantial decline in demand for light novels and books written for entertainment.

Of the nonfiction books, calls for those on various aspects of the war exceeded all others. Mr. Willkie's *One World* and Mr. Lippmann's *U. S. Foreign Policy* were the leaders. Interest in postwar conditions and planning increased during the year. Clergymen were frequently using such subjects as backgrounds for their sermons. Many readers patronized the libraries

to obtain material in support of theories they had or were developing to insure permanent peace and the millenium.

During the past two or three years interest in the Latin American countries has been high. In 1943 it veered more and more toward China and Russia, while antipathy to Japan and Japanese things increased. Atlases and world maps become increasingly popular. They were consulted more in 1943 than in the preceding ten years. It is often said that this is a war of science. As far as the general public is concerned, it is a war in which geography is the principal science.

Of the books of a technical or semitechnical character, those on the general field of aviation were far in the lead. They play the chord of every human emotion—bravery, victory, self-sacrifice, danger, fear, despair; they combine the exactions of science with the freedom of the high upper air. The children, however, continued to read the books they always have liked—fairy tales, animal stories, stories about home and good children and Hiawatha and Alice in Wonderland and The Call of the Wild. It is fortunate that children in this country will not dream of hunger in the future and be terrified by a sudden loud noise. They do not even know of pressure groups and of those who take advantage of their country's peril for selfish purposes.

It would be interesting if a survey could be made of the changes in the reading and thinking habits of scientists. As far as can be inferred from the general correspondence passing through the Office of the Permanent Secretary, the interests of scientists are becoming broader and the interrelations among the sciences are more and more appreciated. For perhaps the first time those interested primarily in the natural sciences and those interested primarily in the social sciences realize a joint responsibility to the social order.

The Mission of the Association

In recent years the number of persons admitted to membership in the Association on the nominations of members has steadily increased. Likewise the number of persons applying directly for admission has increased, particularly in the past two years. In recent months a relatively new phenomenon has appeared.

With increasing frequency members have been inquiring whether they might make presents of membership in the Association to relatives or friends. These inquiries have not been made in the spirit of one desiring to fulfil an obligation to exchange Christmas gifts. Instead, the letters indicate that the writers have been inspired by serious purposes. For example, a father wished to present his son, a student in Yale University, with a membership in the Association in recognition of the excellent work he had been doing in science. A private in the U. S. Army asked the privilege of presenting to his father a membership in the Association. A thoughtful woman made application and paid membership dues for her husband, and another, for a physician of her acquaintance. An officer in the Army Medical Corps took out membership in the Association for a brother serving at the front. Obviously all these were nominations that could be properly accepted, because it is steadily becoming clearer that the great mission of the Association is to advance both the natural and the social sciences not only among professional scientists but also among the great intelligent public.

These nominations for membership, as well as the general correspondence of the Office of the Permanent Secretary, make it evident that only now are scientists and the public realizing what a profound revolution in human life science is making. Of course, it has frequently been remarked that within three generations science and its applications have made greater changes in ways of living than have taken place in the preceding thousand years; and at present the transformation by science of the methods of waging war is the wonder of the world. But these are relatively surface results. Its deeper and more important effects are on the mind. What a vista in space and time science has opened within a few generations! What majestic order in the universe it reveals! How it stirs the imagination, enriches the mind, and stabilizes the emotions!

The characteristics of science are best illustrated in the lives of its most eminent disciples, for example, the president of the Association and the three most immediate of his predecessors. These four representatives of science in the order of their terms of office as presidents of the Association are Irving Langmuir (1941), Arthur Holly Compton (1942), Isaiah Bowman (1943) and the recently elected Anton Julius Carlson (1944). Langmuir was a Nobel Laureate in chemistry in 1932 and Compton a Nobel Laureate in physics in 1927. To the world they are austere superhuman wizards in their respective fields; to their friends they are simply very rare human beings with many and varied interests, endowed with all the fine personal and intellectual qualities of the ideal man, and wholly without guile.

Bowman, geographer, university president, and adviser of the Government in international affairs, to the general public may be a cold and exacting administrator, but to his friends his quick and penetrating mind, aglow with fine qualities, makes him a delightful companion and a sympathetic and just judge of human relations. Carlson, physiologist, university professor and head of a department, Lieutenant Colonel in the Sanitary Corps of the U. S. Army in World War I, to those who do not know him may be only a laboratory recluse whose interests are circumscribed by the horizon of his own special work, but to his friends he is a scientific statesman and humanitarian, standing as inflexibly for human rights and the high ideals of science as the rugged peaks of his boyhood home in Sweden stand against the Arctic blasts that assail them.

Science is much more than delicate laboratory experiments, precise measurements, laborious calculations, and recondite theories. It is necessarily all of that and—more important—it is also a glorious way of life, as the presidents of the Association whose names have been mentioned abundantly illustrate. Once to be a Roman was greater than to be a king. Now to be truly a scientist is greater than to be master of all the forces of Nature. May membership in the Association come to mean always that one enjoying this honor is in this high sense a *scientist!*

Mathematics in Education

In 1915 mathematicians organized a society to advance mathematics as a subject of high importance in education and of practical value in the general affairs of life.

The Mathematical Association of America grew out of the need for an organization to advance the interests of collegiate mathematics and related fields, as distinguished from mathematical research which had for 25 years been adequately nurtured by the American Mathematical Society. The Council of the Society decided in April, 1915, to encourage the formation of a new organization rather than to extend its activities into this field. With this approbation, a group of mathematicians who had for several years conducted the *American Mathematical Monthly,* a journal founded in 1894 by Prof. Benjamin F. Finkel, instituted a movement which led to an organization meeting at Columbus, Ohio, December 30 and 31, 1915. The Mathematical Association began with a charter membership of 1,045 individual members and 52 institutional members; it was incorporated in 1920 under the laws of the State of Illinois.

All this organizational work was carried out under the inspiring guidance of Herbert Ellsworth Slaught of the University of Chicago, who became formally the "Manager" under the new society and joined arduously with the president, E. R. Hedrick, and the Secretary-Treasurer, W. D. Cairns, and many others in the United States and Canada, in bringing about a wide publicity for the new plans. Slaught was largely instrumental in forming plans (1) for studying the reorganization of secondary school mathematics and for the work done by the National Committee on Mathematical Requirements; (2) for the establishment of a score of Sections of the Association; (3) for the possible development of a journal for articles of an expository type, a plan leading to a subsidy for many years whereby the *Annals of Mathematics* was furnished at half price to Association members; (4) for a re-definition of the "units" in secondary mathematics, incorporated in the report published by the National Committee already mentioned; and (5) for the establishment, through the generosity of Mrs. Mary Hegeler Carus, of the Carus Mathematical Monographs, four of which were financed by her and three more by the Association itself from the fund resulting from the sale to members of copies of the first four.

Under the auspices of the Mathematical Association, Chancellor Arnold Buffum Chace of Brown University published, in 1929, a sumptuous edition of the Rhind Mathematical Papyrus and presented most of the edition to the Association. The income from the special fund thus established has been used for subsidizing special projects. The two volumes comprise a photographic facsimile in two colors, the heiroglyphic transcription, a transliteration, literal translation and free translation, besides commentaries and bibliography.

In 1925 the society, with the aid of its then president, J. L. Coolidge, established a prize for a noteworthy expository paper published in English during successive periods of five years by a member of the society. In 1928 W. B. Ford, then president of the Society, gave $500, the income from which was to supplement the original fund so that the prize could be awarded every three years. In 1936 an anonymous gift of $100 was added to this fund. The purpose of the prize is to stimulate expository contributions in mathematical journals on the part of younger American scholars. Six awards of this prize have been made and the seventh is to be made at the end of 1944.

The scope of the society has always advisedly covered, on the one hand, aid and guidance in the beginnings of research, and, on the other hand, an active cooperation with teachers and leaders in secondary mathematics. The former is witnessed by numerous papers on methods of beginning research in various fields which have been given on the general programs and printed in the official journal, the *American Mathematical Monthly;* the latter is witnessed by the part which its members have taken in the organization and development of the National Council of Teachers of Mathematics (in secondary schools). Beginning in 1934, a joint commission of the society and the Na-

tional Council devoted two busy years to a study of the status of secondary mathematics, under a generous appropriation from the General Education Board, and in 1940 published its report on "The Place of Mathematics in Secondary Education" as the Fifteenth Yearbook of the National Council.

The first five volumes of the *Duke Mathematical Journal* were subsidized and the recently established *Mathematical Reviews* is in its earlier years receiving a sizable subsidy. Each of these journals offers a special rate to the Society's members.

Another publication has been the "Outline of the History of Mathematics" by R. C. Archibald, which, under the auspices of the Society has gone through its second, third, fourth and fifth editions.

A War Preparedness Committee, appointed jointly by the American Mathematical Society and the Mathematical Association, during 1939–1942 established contacts with the national authorities regarding utilizing mathematics and mathematicians in the emergency, and in keeping members of these two organizations informed as to how they can best render service. This committee, having finished the work for which it was appointed, has been succeeded by a joint War Policy Committee, which has kept close touch with the War Manpower Commission and the National Roster. Many teachers of college and university mathematics are in the armed services and others are engaged in highly technical projects in the war program, resulting in a dearth of available instructors, which is being met in part by faculty members from related and even remote fields who take "refresher" courses in mathematics in preparation for this work.

Since the Office of Defense Transportation has left it to our organizations to decide whether it is justifiable to hold meetings, this War Policy Committee has recorded its clear judgment that every effort should be made to hold mathematics meetings, emphasizing the importance of sectional meetings, and arranging national and sectional meetings at times and places that will put the least burden on transportation facilities.

The Mathematical Association at present numbers 2,430 individual members with an initiation fee of $2 and annual dues of $4, which pays for a subscription to the *American Mathematical Monthly*, and 109 institutional members with annual dues of $7, which receive two copies of the *Monthly*. The Society has held general meetings nearly every year in the summer and also in the Christmas vacation, always in affiliation with the meetings of the American Mathematical Society. Besides these meetings, the 22 Sections, covering most of the United States, have annual or semi-annual programs, thus giving members opportunity for more frequent attendance upon meetings and a greater chance to present their work and to confer on matters of common interest. The Mathematical Association has for many years been happily and profitably affiliated with the American Association for the Advancement of Science and has two representatives on its Council. The present Secretary-Treasurer is W. B. Carver of Cornell University.—W. D. Cairns.

Officers of the Association

President, Anton J. Carlson; *Permanent Secretary,* F. R. Moulton; *General Secretary,* Otis W. Caldwell; *Treasurer,* W. E. Wrather; *Director of Publications,* F. L. Campbell; *Assistant Secretary,* Sam Woodley.

Executive Committee: Burton E. Livingston, *Chairman;* Joseph W. Barker, Otis W. Caldwell, Walter B. Cannon, Anton J. Carlson, J. McKeen Cattell, Arthur H. Compton, Kirtley F. Mather, F. R. Moulton, Elvin C. Stakman, and W. E. Wrather.

Membership in the Association

According to the Constitution, the objects of the Association are to promote intercourse among those who are cultivating science in different parts of America, to cooperate with other scientific societies and institutions, to give a stronger and more general impulse and more systematic direction to scientific research, and to procure for the labors of scientific men increased facilities and a wider usefulness. Members may reside in any country. A person desiring to become a member of the Association should fill in a membership application card that may be obtained from the Office of the Permanent Secretary and return it with his payment of $5.00 for one year's dues. Every member in good standing receives with his membership a subscription for either *Science* or *The Scientific Monthly*. Dues are for the fiscal year that begins October 1; the subscription begins the following calendar year. A member desiring to receive both journals concurrently may do so by paying $3.00 in addition to the regular dues. Members in good standing receive also, without extra charge, subscriptions for the A.A.A.S. Bulletin, and they may purchase symposia publications at prepublication prices, and after publication at special prices to members.

A person who pays $100 in one fiscal year may be elected a life member; sustaining members pay $1,000. Both classes are exempt from the payment of further dues but are entitled to all the privileges of membership.

An incorporated scientific society or institution or a public or incorporated library may become a member by paying the entrance fee of $5.00 in addition to the dues. Such institution members are entitled to the same privileges as individual members.

Members are encouraged to nominate for membership persons who desire to cooperate in carrying out the objects of the Association. Names may be sent to the Office of the Permanent Secretary at any time. In the letter of invitation to become a member of the Association the name of the person making the nomination is ordinarily mentioned.

Changes of Address

New addresses for the Association's record and for mailing the journals *Science* and *The Scientific Monthy*, as well as the A.A.A.S. Bulletin, should be in the Office of the Permanent Secretary, Washington 25, D. C., at least two weeks in advance of the date when the change is to become effective.